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example of animal mechanics, being interlocked so as to be quite rigid. No traces of hind limbs have as yet come to light, but that section of the skeleton where they might have been was unfortunately defective. The material will be described at length in a Bulletin of the National Museum.

*Apropos* of *Zeuglodon* Mr. Schuchert characterizes the statement that their remains are so plentiful as to be used for building stone wall as a myth, but it will doubtless continue to live on in text-books in company with the figure of the pouched rat with everted pouches, which has held its place ever since the first description of the animal and seems likely to last indefinitely.

F. A. L.

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#### SCIENTIFIC NOTES AND NEWS.

##### THE BOTANICAL SURVEY OF NEBRASKA.

IN the *American Naturalist*, for June, Professor Charles E. Bessey gives an account of the 'Progress of the Botanical Survey of Nebraska.' The Survey, though a private enterprise, has received encouragement and support from the State Board of Agriculture, the State Horticultural Society and from the University of Nebraska, the work being in the hands of a 'Botanical Seminar' composed of Graduates of the University. The first important work issued by the Survey was H. J. Webber's 'Catalogue of the Flora of Nebraska,' published in 1890 in the Report of the State Board of Agriculture, and also issued as a separate Monograph. In it 1,890 species were enumerated, almost equally divided between flowering and non-flowering plants, nearly all of which were based on actual specimens in the possession of the author. Since this time the work has been steadily continued and the results have been published at frequent intervals, so that the list of known species now catalogued reaches about 3,050. Additional studies have been made in special directions on the distribution of

species. Of the 64 trees and 77 shrubs known to occur in the State the distribution is already well ascertained. The final Report of the survey is in preparation. It will be entitled the *Flora of Nebraska*, and will be issued in twenty-five parts of about 50 pages each. Part I. and part II. were issued in August, 1894 (reviewed in *SCIENCE*, Jan. 4, p. 25), and part XXII. The *Calyciflora* is now in press.

##### M. ANDRÉE'S POLAR EXPEDITION.

A COMMITTEE of the Paris Academy of Sciences, consisting of MM. Faye, Daubrée and Blanchard, have reported on the project of M. Andrée to explore the polar regions by balloon. They state that under the circumstances he is likely to reach the pole and will be able to solve many problems of scientific interest. But they fear that the return to inhabited regions will involve serious difficulties.

In the meanwhile M. Andrée is in Paris superintending the construction of a balloon. The balloon is to be of sufficient size to carry three persons, scientific instruments and provisions for four months and a boat transformable into a sledge, weighing in all about 3,000 kg. Gas under pressure in cylinders will be taken in order to refill the balloon from time to time—sufficient to keep the balloon in the air for thirty days.

M. Andrée expects to start from one of the Norwegian Islands of the Spitzbergen Archipelago situated to the extreme north-west of the mainland. July is fixed as the month of departure. A clear day will be chosen with a south wind. The balloon will travel at a minimum rate of 27 km. an hour, and M. Andrée hopes to reach the pole in a voyage of forty-three hours and to return safely to the inhabited regions of North America or Siberia.

According to an account in the *Revue Scientifique* by M. Ch. Rabot, the meteoro

logical conditions of Spitzbergen are very favorable for a long aeronautical voyage. The sun in July never sinks below the horizon, and the variations of temperature are consequently very slight. The lowest temperature observed in July, 1883, at Cape Thorsen, was  $+0^{\circ}.8$  and the highest,  $+11^{\circ}.6$ . At Spitzbergen, during the first fortnight in August, 1892, the largest daily variation observed was  $3^{\circ}$ , and as a rule it was not greater than  $1^{\circ}.5$ . The movements of the balloon would therefore be very regular. There is no storm to be feared in the polar regions. The rainfall is small, and a fall of snow at this time of the year would be no obstacle to the balloon.

#### THE UPPER REGION OF THE ATMOSPHERE.

ACCORDING to the *London Times*, at the last meeting of the Royal Institution for the present season Professor Alfred Cornu, F. R. S., of the Paris Academy of Sciences, delivered an address in French on the 'Les Phénomènes Physiques des Hautes Régions de l'Atmosphère.'

M. Cornu began by comparing the atmosphere to an immense thermo-dynamic engine, the sun being the source of heat and the interplanetary space the condenser. The most interesting phenomena took place in the almost inaccessible parts of the atmosphere, and though the difficulties of getting information about those elevated regions were great, yet he hoped to show that the physicist was beginning to know much of the real explanation of natural phenomena and was even able to reproduce them in his laboratory. Among the unexpected static phenomena discovered by ballooning and in mountain observatories M. Cornu instanced three—namely, the facts that many clouds which had generally been regarded as consisting of vapour were composed of minute crystals of ice; that at different heights the direction of the wind was different; and that the temperature

did not get steadily lower as the earth became more distant, but that alternate layers of hot and cold air were encountered. The first and last of these facts might have been ascertained by indirect means from consideration of certain optical phenomena. From the solar halo might be inferred the presence of ice crystals in cirrus cloud; they had the power of refracting light, and refraction of the sun's light by passing through cloud would fully explain the halo. It could be reproduced artificially by passing a beam of light through a strong solution of alum, with a little alcohol added. The alternations of heat and cold in the atmosphere were deducible from the various forms of mirage, which depended on the reflection of light from the surface of the different layers. M. Cornu gave an ingenious reproduction of the 'Alpine glow,' sometimes seen in the Bernese Oberland, for an example. A valley between two peaks would become filled with hot air under the influence of the sun, and the path of the rays of light reflected from the surface of the hot layer would be convex as regarded from the earth. After sunset the hot air would rise and the cool take its place, thus producing a hot layer of air above of a cooler one. The light from the sun would now be reflected into a concave ray, which would bend down and illuminate the mountain, though the sun was in fact below the horizon. M. Cornu then proceeded to speak of the dynamic phenomena of the air. He said that the solar energy was of three kinds—mechanical energy (appearing as winds, cyclones, etc.), calorific energy (shown by the change of the state of matter, as of water into vapour), and electrical. He only proposed to deal with the first of these. The wind was the most simple mechanical manifestation and had its origin in the difference of atmospheric pressure in two distant places. It never blew in the direction of the line join-

ing the points of greatest and least pressure, but always obliquely to the isobarometric lines, and usually with a circular movement round the points of highest and lowest pressure. When from any cause the equilibrium of the atmosphere was broken down, circular movements of enormous force, such as tornadoes and cyclones, were set up. The lecture concluded with the exhibition of an artificial waterspout.

#### LIGHTNING IN THE UNITED STATES.

THE U. S. Department of Agriculture has issued a bulletin on *Protection from Lightning* by Mr. Alexander McAidie, which gives some interesting statistics concerning the prevalence of injury from lightning in the United States.

In 1891 the Weather Bureau issued to its observers instructions to report at the end of every month the names, with corroborative dates and places, of all persons killed by violent wind storms, tornadoes and lightning, as also damage to property.

There were reported in 1891, 204 persons killed; in 1892, 251; in 1893, 209, and in 1894, 336. In addition to those killed during 1894, 351 persons were severely injured. The injury to property during the year was as follows: 268 barns struck with a damage of \$407,500; 55 churches struck, damage unknown; 261 dwellings and several oil tanks, factories and elevators, the damage amounting to not less than \$351,000.

The report strongly recommends the use of lightning conductors in thinly settled districts, but does not give statistics concerning the relative amount of protection supplied by them.

#### GENERAL.

DANIEL CADY EATON, professor of botany in Yale University, died on June 29th at the age of sixty years.

THERE will be held at Paris in 1896 an *International Congress of Applied Chemistry*.

The committee of organization met at Paris on June 4th to make preliminary arrangements, and decided on the ten sections in which the Congress should meet.

THE Division of Ornithology and Mammalogy, Department of Agriculture, has in press a Bulletin by Professor Beal on the Food of Woodpeckers, an abstract of which was recently given in SCIENCE. Mr. F. A. Lucas has contributed a short chapter on the tongues of woodpeckers, and the relation between the character of the tongue and the nature of the food. He concludes that modifications of the tongue, at least external modifications, are directly due to peculiarities of food or feeding, and are not of taxonomic value.

THE removal of Professor George Davidson, head of the Coast and Geodetic Survey on the Pacific Coast, is severely criticised. Telegrams have been sent protesting against this action from Senators Perkins, White and Allison, and from many others. The officers of the Lick Observatory sent the following dispatch:

LICK OBSERVATORY, July 2d.

To President of the United States, Washington:

The undersigned, astronomers of the Lick Observatory, respectfully call your attention to an act of great injustice done to one of the most active and efficient of our Government employees, Professor George Davidson, for many years connected with the United States Coast Survey, who has been removed from his position. Recently published scientific records demonstrate that he is still one of the most active workers in the Survey. It would be an act of simple justice to reinstate him. We earnestly request you to cause this to be done.

Respectfully,

E. S. HOLDEN,  
J. M. SCHAEFERLE,  
E. E. BARNARD,  
W. W. CAMPBELL.

MR. GEORGE S. DAVIS has decided to discontinue the publication of *The Index Medicus*. In a circular letter to the subscribers he states that since 1885 the loss has been between \$500 and \$1,000 annually, and that it would probably amount to \$2,000 in

1895. The discontinuation of *The Index Medicus* will be a serious loss to medical science throughout the world.

SCIENCE PROGRESS, which since its establishment a year and a half ago, has maintained a high standard as a monthly review of current scientific investigation, will hereafter be published in America by D. C. Heath & Co.

DR. FRIEDRICH TIETJEN, professor of higher mathematics in the University of Berlin and director of the bureau of calculation of the observatory, died at Berlin on June 22d.

DR. P. A. A. S. VERNEUIL, professor of surgery in the Hotel-Dieu and eminent for his contributions to surgery, died near Paris on June 11th at the age of 71 years.

DR. LEONARD STEJNEGER has been sent by the United States Fish Commission, with the permission of the State Department of Russia, on a special mission to the Commander Group of Islands with a view to investigating the fur seals.

MR. WILLIS N. MOORE, now in charge of the forecasting office of the Weather Bureau at Chicago, has succeeded Professor Mark W. Harrington as Chief of the Weather Bureau.

DR. HANS WILHELM MEYER, of Copenhagen, died at Venice on June 3d at 71 years of age. His method of removing so-called allenoid vegetations from the lymphoid tissue in the post-nasal space is regarded as one of the most important advances of modern surgery. These growths are said to occur in more than one per cent. of all school children and to be a foremost cause of deafness and deficient bodily and mental development.

M. DAUBRÉE announced, at the meeting of the Paris Academy of Sciences on June 4th, that Dr. Nordenskjöld, professor of mineralogy, geology and geography in the University of Upsala, Dr. Dusen and Dr.

Ohlin will undertake a scientific expedition to Terra del Fuego, in September next, with the coöperation of the Swedish and Argentine governments.

AN expedition into central Africa will shortly be undertaken under the auspices of the Italian Geographical Society, and under the direction of the explorer Captain Böttogo. The party will include the geologists, Prof. de Stefani, of Florence, and Prof. Bucca, of Catania, and the biologists, Prof. Vinciguerra, of Genoa, and Dr. Sacchi, of Rome.

AT the Commencement Exercises at Yale University, Prof. George Fisher introduced a resolution of regret, which was unanimously adopted, on the death of Prof. James Dwight Dana. He announced that if \$4,500 more were raised, a pedestal and bust of the late professor would be erected on the campus.

THE neurologists of the United States have subscribed about \$800 towards the monument to be erected in honor of Charcot. The sum of about \$8,000 has been collected for this purpose.

MR. R. F. STUPART has been appointed director of the meteorological service of Canada.

SIR GEORGE HORNIDGE PORTER, regius professor of surgery in the University of Dublin, died on June 20th, at the age of 73.

DR. JOSEPH S. SHAW, professor of chemistry at Rock Hill College, Ellicott City, Md., died suddenly on June 27th.

A 'CONFERENCE OF EVOLUTIONISTS' was held at Eliot, Me., from July 6th to 13th. Among the speakers expected were Prof. E. D. Cope, Prof. E. S. Morse, Mr. John Fiske and Dr. L. G. Janes.

It is stated in *Nature* that the first number of a bimonthly journal for sanitary engineers will be published at Brussels on August 1, under the title *La Technologie Sanitaire*. It will be under the direction of an edi-

torial committee, the secretary of which is M. Victor J. Van Lint, 115 rue Joseph II., Bruxelles. The journal will deal with all questions relating to public health.

*L'Association française pour l'avancement des sciences* will hold its twenty-fourth session at Bordeaux, August 4th to 9th.

ACCORDING to the Monthly Bulletin of the Board of Health of the State of New York the average daily mortality for the month of May was 308 as compared with 368 for the preceding four months of the year. The improvement was due to the suspension of the epidemic of grip, which began in January.

ARRANGEMENTS are being made by the Marine Biological Association [England] for a series of dredging and trawling expeditions during July, August and September, to investigate the fauna and flora of the outlying grounds between the Eddystone Rocks and Start Point. In order to make the results as complete as possible, it is extremely desirable that the investigation of each group should be carried out by a competent naturalist. Zoölogists and botanists who are willing to take part in these expeditions, or to assist in working out the material collected, are requested to communicate with the director, the Laboratory, Plymouth.—*Academy*.

#### EDUCATIONAL AND UNIVERSITY NEWS.

On July 29th Judge Ross, in the United States District Court, San Francisco, made a decision in favor of the Stanford estate against the claim of the Government for \$15,000,000.

DR. CARL BARUS, of the Smithsonian Institution, Washington, has accepted the Hazard professorship of physics in Brown University. It is stated that Brown University has recently spent \$100,000 in the building and equipment of a physical laboratory.

A NEW edition of the quinquennial catalogue of Harvard University has been issued from the University press. It now requires a volume of 515 closely printed octavo pages to include the officers and graduates of the University since 1636.

DR. THEOBALD SMITH, Chief of the Division of Animal Pathology in the Bureau of Animal Industry, Department of Agriculture, has been offered a professorship in Howard University.

GEORGE WILLIAM SMITH, who recently declined the presidency of the University of Kansas, has been elected president of Colgate University. He is now professor of history in Colgate University.

MR. ARTHUR F. NESBIT, of Milton, Pa., graduate of the Massachusetts Institute of Technology, has been appointed instructor of physics and electrical engineering in the New Hampshire College of Agriculture.

THE quarterly statement of President Harper, of the University of Chicago, shows that the teaching staff of the university at present consists of 164 professors and instructors. The total enrollment of students for the year has been 1587, and for the summer quarter between 600 and 700 have already registered. The trustees of the Ogden estate have added \$50,000 to the sum already given to the University.

THE University of Vermont has bought for \$12,000 a house at Burlington which will be used as a dormitory for women students.

It is stated that Dr. Pearsons has offered on certain conditions to give \$50,000 each to Berea College and Whitman College.

THE buildings of the University of Missouri destroyed by fire January 9th, 1892, have now been rebuilt at a cost of \$500,000. Seven new buildings are ready for use, including a chemical building, a biological and geological building and a physical and engineering building.